INFORMATION BULLETIN / PLUMBING.
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SUCTION TANK OVERFLOW FOR PRIVATE FIRE PROTECTION SYSTEMS

SCOPE

This Information Bulletin applies to the installation of overflows in suction tanks. Gravity and pressure tanks are beyond the scope of this bulletin.

BACKGROUND

Aging buildings have had failures in the fill line solenoid valve resulting in flooding the pump room and the basement. The termination of the overflow has become a major issue and could have disastrous economic effects, if not addressed early in the design phase.

DEFINITIONS

1. **Gravity Tank**: A tank that can provide the needed supply without the use of a pump. All the energy for the system is available from the height of the gravity tank.

2. **Pressure Tank**: A tank that can provide the needed supply without the use of a pump. All the energy for the system is available from the air pressure in the pressure tank.

3. **Suction Tank**: A tank installed in combination with a pump. The required energy for the system is provided by the pump.

4. **Sewage Ejector System**: A system used to lift the discharge from the fixtures located below the crown level of the sewer to the building drain or building sewer.

5. **Sump Pump System**: A system used for removing water from rainwater drains, subsoil drainage, emergency drains, or other systems not considered sewage.

I. DISCHARGE LOCATION

The overflow from the tank may discharge to the storm drain, under the street curb, the yard, the sewer, or any other location approved by the Department subject to the following conditions:

1. Discharge to the street curb or public storm drain is subject to the approval from the Bureau of Engineering, Department of Public Works.

2. When discharging to the yard, attention shall be paid not to let water sheet flow over the public sidewalk.

3. When discharging to the sewer, attention needs to be paid to the sizing of the piping collecting the discharge from the overflow. In fact, the overflow water is equivalent to two fixture units for every gallon per minute of discharge (Los Angeles Plumbing Code Section 94.702.3). Since the

overflow is not expected to ever work, the building sewer would have to be sized for the waste of the building. There is a possibility that the designer is challenged with not meeting the minimum flow requirements with only the waste from the building, or exceeding the capacity of the building sewer when the discharge from the overflow is added to fixture unit load of the building.

Alternatively, one can install a dedicated building sewer designed only for the discharge of the overflow.

4. Sewage ejector(s) with a rated discharge capacity of more than 25 GPM require approval from the Los Angeles Sanitation department.

II. OVERFLOW PIPING

A. Materials

The overflow piping shall be made of materials approved for fire protection or drainage systems.

B. Slope

Overflow piping shall not be installed in such a way to trap water. The overflow piping may be installed upward if:

1. The roof of the tank is water tight, and
2. The termination of the tank vent is above any point of the overflow piping, and
3. A structural engineer has determined that the tank, including the roof, can withstand the weight of the water at the maximum pressure that the system can experience. In absence of pressure regulators, such a pressure is the high pressure in the city main plus the pressure due to difference in elevation between the meter and the roof of the tank.

C. Termination

When the overflow piping terminates inside the building, it may be connected to the drainage piping or the rain water system by means of a funnel type air-gap fitting, to a hub drain.

D. Drainage Piping

1. Drainage and venting piping materials, shall comply with Chapter 7 and 9 of the Los Angeles Plumbing Code.
2. If the overflow discharges to the sewer, or to a sewage ejector, the air-gap shall be trapped and vented, and the trap shall be connected to a trap primer.
3. If the overflow discharges to another system, the design shall comply with the requirements of such system.

III. VOLUME RATE FROM THE TANK OVERFLOW

1. The expected volume rate from the tank overflow shall be based on the event that the fill line fails to close.

2. When multiple fill lines are installed, the flow can be calculated based on the failure of the largest fill line serving the tank.

3. Fill line(s) can be equipped with pressure reducing valves, orifices or other devices in order to reduce the flow of each line, in which case the effect of such a device shall be taken into consideration when calculating the water flow.

4. When installing devices to reduce the flow, the fill line(s) shall be capable of suppling at least the minimum required volume of water both at the high and low pressure in the street main.

5. The expected volume rate through the overflow shall be calculated taking into consideration the high pressure in the city main. The high pressure at a given flow can be calculated by adding to the pressure at that flow the difference between the high and low pressure at 0 (zero) gpm.

6 Gravity drainage or pumps shall be sized to handle the overflow volume. When converted into drainage fixture units, two fixture units shall be equal to each gallon per minute of flow.

IV. SUMP PUMP SYSTEM

Whenever possible, the overflow shall drain by gravity. When the overflow cannot drain by gravity, it may drain into a sump, from where it can be pumped to the storm drain, under the curb, the yard, the sewer, or any other location approved by the Department.

A sump pump system consists of three components: the drainage piping, the basin, and the pumps.

A. Drainage Piping

1. The sump system shall be designed in accordance with the requirements of Chapter 7 of the Los Angeles Plumbing Code, except if the sump is not connected to the sewer, the

sump vent may terminate in the garage, at least 6” above the air-gap, or the flood level of the highest fixture served if all the following conditions are met:

a. The sump receives water from the tank overflow or from the tank overflow and emergency drains.

b. The sump does not discharge to the sewer.

2. The size of the vent shall be in accordance with Table 703.2 of the Los Angeles Plumbing Code, based on the estimated number of fixture units going into the sump. The number of fixture units accounted for the overflow may be based on the trap size.

3. The sump discharge shall terminate into a gravity line.

B. Basin

1. Basins shall be constructed of concrete or metal. Basins made of fiberglass or other materials and factory made basins shall be listed by a City of Los Angeles recognized listing agency.

2. For basins constructed of poured concrete, the bottom shall be adequately reinforced and designed to recognized acceptable standards and a building permit may be required.

3. Metal basins shall have a minimum thickness of 12 gage, and shall be treated internally and externally to resist corrosion.

4. Fiberglass basins shall be installed in accordance with their conditions of approval; and when installed below grade, they shall be installed on a level four-inch concrete slab.

5. All sump basins shall have a water tight cover.

6. The sump basin may also receive water from subsurface drainage, emergency garage drains, and garage trench drains.

7. If the sump serves multiple systems, backwater valves shall be installed where necessary to prevent flooding in the event of pump failure or stoppage in the piping.

C. Pumps

1. Explosion proof pumps are required when used in areas that may contain an explosive atmosphere, such as parking garages or methane zones. Explosion proof pumps shall be listed as type Class 1 Division1. (National Electrical Code article 501)

2. Sumps shall be provided with dual pumps. Each pump shall be sized for the entire load.

3. The pump shall be sized based on the expected flow in the event the fill line valve fails to close.

4. When multiple fill lines are installed, the pump may be sized based on the failure of the largest fill valve serving the tank.

5. When the sump serves more than one system, the sump pump shall have enough capacity to discharge the maximum volume of water flowing from all systems simultaneously.

D. Fire Tank Overflow and Pump Sizing acknowledgement

Since the tank fill line, which will determine the size of the overflow, is installed by a fire protection contractor, the owner of the building or the owner's representative shall sign a form in which acknowledges the expected volume of overflow.

A copy of the signed acknowledgment, form showing the expected overflow volume, shall be included in the plumbing plans. A copy of the form can be found on page 6.

CITY LA DBS
DEPARTMENT OF BUILDING AND SAFETY

[FORM FT-1]

Fire Tank Overflow and Pump Sizing Acknowledgement

(The final signed copy of this form shall be included on the plumbing plans)

Date: _____

Project Address: _____

Permit Application No. _____

The undersigned hereby certifies that I am the owner or the owner's representative of the property located at the above address and I acknowledge that the water flow in each of the fire tank fill lines shall not exceed _____gallons per minute (gpm)

_____ ☐ Owner
Name ☐ Owner's Representative

_____ Date: _____
Signature